The Impact of Community Pharmacies on regional equity in access to professional rapid antigen testing for SARS-CoV-2 in Portugal

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INTRODUCTION & OBJECTIVES

- The COVID-19 disease, caused by the new coronavirus of severe acute respiratory syndrome 2 (SARS-CoV-2), was declared a global pandemic on March 11th of 2020[1].
- Several public health measures were adopted to reduce the risk of individual transmission improving early detection and isolation of new cases, such as a **100% reimbursement of SARS-CoV-2 professional rapid antigen detection testing (Ag-RDT), by the National Health Service (NHS),** to the population at clinical pathology laboratories, and later at community pharmacies and other authorized entities[2,3].
- Alongside, an easy and equitable access to testing is of major concern of governments and health authorities, in order to tackle inequalities in access. The testing strategy must therefore respond to the health needs of the population as a whole and seek to mitigate inequalities.

OBJECTIVES:

→ **to evaluate the increase in the capacity of professional Ag-RDT offered by the integration of community pharmacies into the NHS testing strategy and**

→ **to compare the equity level in the access to testing with and without the pharmacies' participation**

METHODS

- This was an **analytical study** based on the number of **weekly hours** available of the authorized structures to perform Ag-RDT and their **geographic location, in Portugal mainland,** until January 31st, 2022.
- The average distance (in Kms) of the resident population by municipality, to the nearest Ag-RDT site (1) and the average number of weekly hours available to perform the service, per 1,000 inhabitants and municipality (2), in total and for the 3 groups (pharmacies, laboratories and other structures) were computed.
- To **assess equity, Lorenz curves and Gini index were calculated** for 1) the distance of the population to the nearest testing site of each geographic unit and ordered by average distance per habitant and 2) for the number of hours of access to professional TRAg available for each geographic unit ordered by the ratio hours / 1,000 habitants. Results were computed with and without the pharmacies' participation and stratified by municipality subgroups according to 3 sociodemographic determinants: population density, aging index and per capita purchasing power index.

RESULTS

Mapping the entities providing free SARS-CoV-2 Ag-RDT

Pharmacies: **1,369** (65.1%)

Laboratories: **679** (32.3%)

Other entities: **56** (2.7%)

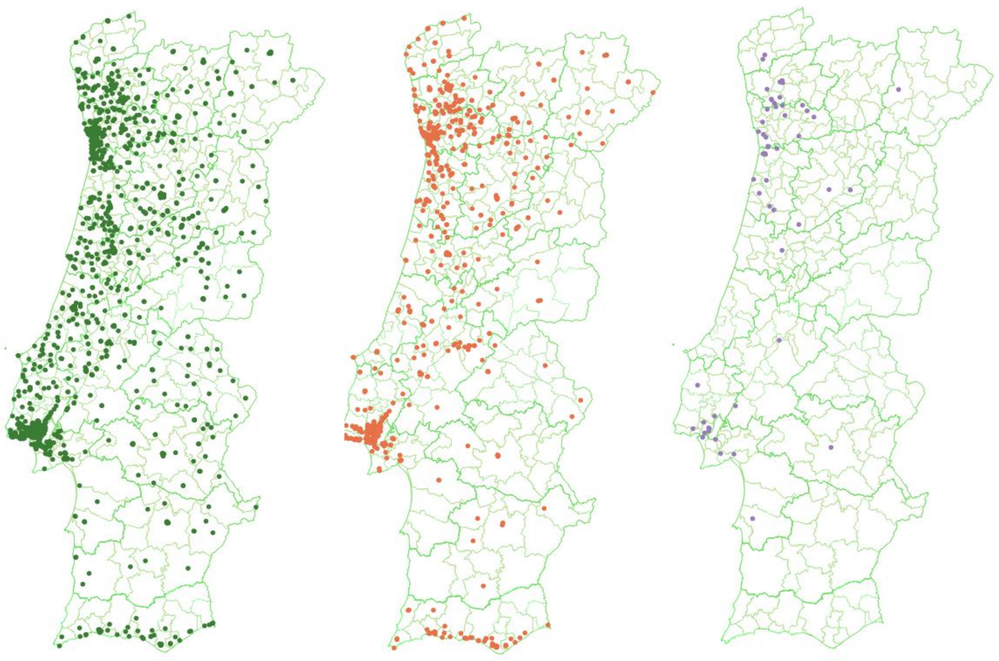


Figure 1. Entities providing free SARS-CoV-2 Ag-RDT to the population in Portugal mainland, on January 31st, 2022.

Table 1. Availability of Ag-RDT by type of entity

Entities	Total n (%)	Covered municipalities n (%)	Entities per municipality	Covered resident population (%)	Average distance to entities (Km)	Average hours per 1000 inhabitants (h)
Pharmacies	1,369 (65.1%)	247 (88.8%)	4.9	97.4%	2.2	9.4
Laboratories and other structures	735 (34.9%)	192 (69.1%)	2.6	90.7%	3.7	2.1
All	2,104 (100.0%)	266 (95.7%)	7.6	99.3%	1.8	11.5

- Without the participation of the pharmacies, the average distance of each person to the nearest Ag-RDT location was 3.7 km, **decreasing to 1.8 km with the inclusion of community pharmacies** (Table 1)**.**
- Regarding the estimated **average of weekly hours** available to test per 1,000 inhabitants, without pharmacies there were 2.1 weekly hours available, compared to **11.5 (5.5 times higher) when including community pharmacies.**

Equity to access free SARS-CoV-2 Ag-RDT

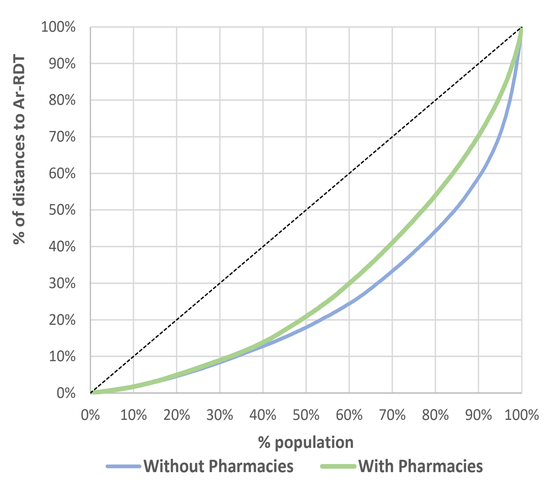


Figure 2. Concentration of average distances (Km) of the population to the nearest professional Ag-RDT site available of each geographic unit, with and without Pharmacies

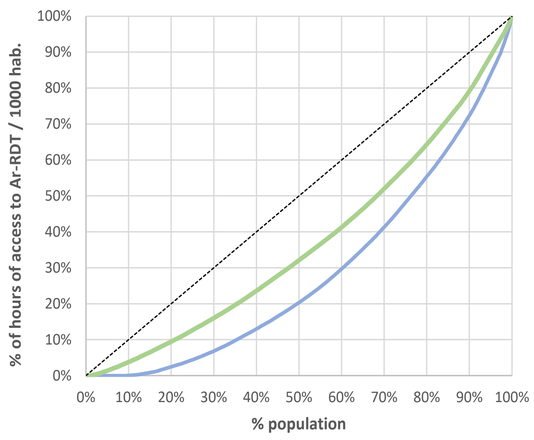
(1) Average distance (Kms)

For the distribution of distances, **Gini index reduced from 0.50 to 0.42 (a 16.8% decrease in the measure of inequality with the inclusion of pharmacies).**

This result was even higher when considering the more vulnerable groups of society as providing this service at pharmacies allowed for a reduction in access inequalities in municipalities with lower population density (-38.1%), higher aging index (-32.2%).

Table 2. Gini index for the distance of the population to the nearest professional Ag-RDT site available of each geographic unit, with and without Pharmacies, stratified by subgroup of municipalities according to population density, aging index and per capita purchasing power index.

Entities	Total Mainland	Population density		Aging index		Per capita purchasing power index	
		Below average	Above average	Below average	Above average	Below average	Above average
Without Pharmacies	0.50	0,41	0.36	0.37	0.47	0.48	0.38
With Pharmacies	0.42	0.26	0.34	0.36	0.32	0.41	0.37
Variation (%)	-16.8%	-38.1%	-7.6%	-1.4%	-32.2%	-15.2%	-4.1%



(2) Average number of weekly hours

The **Gini index for the distribution of weekly hours of access was initially of 0.42 decreasing to 0.26 with the inclusion of pharmacies, reflecting a reduction of about 39% in the measure of inequality.**

This result was even higher when considering the more vulnerable groups of society as providing this service at pharmacies allowed for a reduction in access inequalities in municipalities with lower population density (-43.3%), higher aging index (-51.3%) and lower per capita purchasing power index (-54.6%).

Figure 3. Concentration of average number of hours of access of the population to the nearest professional Ag-RDT site available of each geographic unit, with and without Pharmacies

Table 3. Gini index for the number of hours of access to the nearest professional Ag-RDT site available of each geographic unit, with and without Pharmacies, stratified by subgroup of municipalities according to population density, aging index and per capita purchasing power index.

Entities	Total Mainland	Population density		Aging index		Per capita purchasing power index	
		Below average	Above average	Below average	Above average	Below average	Above average
Without Pharmacies	0.42	0.47	0.30	0.35	0.51	0.59	0.37
With Pharmacies	0.26	0.27	0.22	0.24	0.25	0.27	0.25
Variation (%)	-38.6%	-43.3%	-27.9%	-30.7%	-51.3%	-54.6%	-33.9%

CONCLUSIONS

- Results suggest that **pharmacies can fill geographical and socioeconomic gaps in the national territorial coverage** in the access indicators studied.
- **Without pharmacies**, the provision of the Ag-RDT service to the population would have a territory coverage with **significant gaps** and increasing inequalities in the population.
- The **participation of Pharmacies in Ag-RDT reduces substantially the measures of inequality**, resulting in the improvement of equity of access to this service in Portugal, with greater impact in subgroups of the population that are already more vulnerable

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International Society for Pharmacoeconomics and Outcomes Research, ISPOR Europe 2022, 6-9 November